November 4, 2008

To: St. Olaf Faculty
From: Curriculum Committee
Re: Proposed New Courses

At the November Faculty Meeting the Curriculum Committee will move that the faculty approve The Science Conversation, an interdisciplinary sequence of three general education courses, modeled after our other conversations programs, intended to develop students' understanding of the emergence and the contemporary practice of science in historical, theological, and social contexts.

Catalog Description:

The Science Conversation

The Science Conversation brings together students and faculty with a broad range of academic interests for a critical exploration of science within its historical, philosophical, theological, and social contexts. This sequence of courses cultivates an appreciation for the development of science, the relationship between reason and faith, questions of meaning and purpose, and the complex interplay of science and society. The program illuminates the distinctive character of science and its relevance to challenges facing our world.

ADMISSION TO THE PROGRAM

Each year faculty of the Science Conversation choose 24 sophomore students to participate in the program. Acceptance into the program is based on a one-page expression of interest in the program. The program seeks to achieve a balance between science and non-science majors.

GENERAL EDUCATION

By successfully completing all three courses of the Science Conversation a student fulfills the following general education requirements:

Integrated Scientific Topics OR Scientific Exploration and Discovery (IST/SED)
Historical Studies in Western Culture (HWC)
Biblical and Theological Studies – Theology (BTS-T)
Studies in Human Behavior and Society (HBS)
Writing in Context (WRI)

COURSES

Science Conversation 213-217 are offered only to sophomores enrolled in the Science Conversation. Science Conversation students must take these courses in sequence.

213 The Rise of Modern Science: Origins and Revolutions

This course examines the development of modern science as revealed by primary texts and analysis of key episodes. Beginning with Aristotle, Copernicus, and Galileo, students gain a deeper understanding of the ideas, personalities, and events that shaped the emergence of the modern scientific view of the natural world. The course considers the historical, philosophical, and theological dimensions of major revolutions in science along with important contemporary developments.

215 The Well-Ordered Universe: Patterns and Models in Science

This course engages students in scientific inquiry while investigating its broader significance. Students perform experiments from a variety of disciplines to encounter landmark ideas and to investigate the range of quantitative approaches used to proceed from raw data to conclusions. The human ability to recognize patterns and develop models is examined to understand scientific methods and to assess the power, limits, and current status of the natural and behavioral sciences. Prerequisite: Science Conversation 213.

217 The Cultural Context: Science and Society

This course examines the mutual influences of science and society while exploring the historical, political, economic, and religious aspects of these influences. It concerns the institutional settings that shape the practices of science and the vocation of scientists. It analyzes theological perspectives as they appropriate, resist, and advance science. Prerequisites: Science Conversation 213 and 215.

Rationale:

History and Context for the Proposal: The proposed Science Conversation (SciCon) emerges from discussions involving members of the physics, psychology, religion, economics, philosophy, MSCS, biology, and other departments. The program will build on existing strengths in our curriculum, our faculty, and our mission and history to offer a significant advance in teaching and learning. St. Olaf is nationally known for excellence in the academic disciplines involved in SciCon. We have long experience and success with the curricular model of the "conversation." Participating students and faculty will constitute a learning community that follows a pattern well-established at St. Olaf College and well regarded in the academy. The Great Conversation, American Conversations, and Asian Conversations have consistently demonstrated the efficacy of the learning cohort model. One pilot course of the SciCon has been offered successfully this academic year. The program in its entirety would be offered for the first time in 2009-10.

Student Outcomes: Students who participate in the SciCon will gain an appreciation for the development of science, relationships between reason and faith, questions of meaning and purpose, and the complex interplay of science and society. They will be better prepared to engage in contemporary debates about issues like global warming, genetic engineering, stem cell

research, and new cosmologies. Just as importantly, they will gain skills and perspective for a lifetime of responsible citizenship, with the confidence to think and act at the intersection of science, ethics, theology, and religion.

Staffing: SciCon will be staffed by a team of faculty recruited by the director in consultation with associate deans and department chairs. For the first years of the program, we hope that external money will fund a team of six faculty for the three courses (two faculty members in each of the three courses) with the aim of developing faculty capacity to negotiate the interdisciplinary content of the program. Subsequently, the dean's council intends to staff the program with four faculty (one principal instructor for each course and fourth faculty member collaborating with each to provide continuity across the three courses). The Curriculum Committee is mindful of good reasons to try to staff SciCon this way (e.g., to facilitate the richest possible interdisciplinary discussions and to ensure appropriate area expertise in the classroom at all times). But the committee also urges the Dean's Council to consider carefully the balanced allocation of staff resources among this and other interdisciplinary programs of the college.

Course Guidelines: The faculty team for each year will develop distinct syllabi reflecting their interests and expertise. But in every case, the content of syllabi will be governed by guidelines for GE and specific guidelines for each SciCon course. SciCon course guidelines follow:

Every syllabus for Science Conversation 213, "The Rise of Modern Science," will meet the following criteria:

1. It will analyze the historical development of modern science, with attention to at least two major episodes or revolutions, beginning with the Copernican revolution and its connection to ancient ideas held by Aristotle and others.
2. It will discuss the philosophical dimensions of science, with attention to methods and epistemology, interpretation and meaning, as well as social and/or institutional factors.
3. It will examine the historical relationships between science and religion and between scientists, theologians, and church authorities.
4. It will study a significant development in science that dates from the twentieth century or later, in light of the historical, philosophical, and theological background established earlier in the course.

Every syllabus for Science Conversation 215, "The Well-Ordered Universe," will meet the following criteria:

1. It will contain a significant laboratory component.
2. It will feature experiments chosen to illustrate landmark ideas from across the sciences.
3. It will compare and contrast the quantitative methods necessary to carry out a range of different scientific investigations.
4. It will question the broader significance of scientific inquiry by critically examining the notion of a scientific method, by investigating the power, limits, and current status of the natural and behavioral sciences, and by taking into account social factors that may affect the development of science, such as gender and politics.

Every syllabus for Science Conversation 217, “The Cultural Context,” will meet the following criteria:

1. It will analyze how science shapes and is shaped by its social contexts.
2. It will discuss the methods that social sciences use to examine phenomena, including science itself.
3. It will examine how science and theology affect each other as they shape reflection upon the origin, nature, and destiny of human life and the cosmos.
4. It will critically examine one or more contemporary debates that feature the interactions of science and society.